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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/417,832	10/14/1999	TOMONARI HORIKIRI	35.C13929	8008

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FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

RUTHKOSKY, MARK

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 12/16/2002

21

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/417,832

Applicant(s)

HORIKIRI ET AL.

Examiner

Mark Ruthkosky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1,2 and 4-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 12,20. 6) ☐ Other: _____

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DETAILED ACTION

Summary

1. Claims 1, 2 and 4-7 are pending.

Specification

2. The amendment filed 11/20/2000 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: The amendment states that the gelling agent does not free an aldehyde based on dibenzylidene sorbitol derivatives in the prior art. The specification does not specifically state this limitation. The specification and claims further state that dibenzylidene sorbitol derivatives may be used as the gelling agent of the invention (see claim 5 and page 15.) In addition, the claims state that the gelling agent of the invention is non-polymeric. This also contradicts the invention as various polymeric gelling agents are provided in the specification and claims (see page 15, for example.)

Applicant is required to cancel the new matter in the reply to this Office Action.

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Claim Rejections - 35 U.S.C. § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. The rejection of claims 1-4, 6 and 7 under 35 U.S.C. 102(b) as being anticipated by Green et al. (WO 98/11619) has been overcome by the applicant's amendment.

5. The rejection of claims 1-5 and 7 are rejected under 35 U.S.C. 102(a) as being anticipated by JP 11185836 A has been overcome by the applicant's submission of a sworn translation of the priority application.

6. Claims 1, 4, 5, 6 and 8-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Williams et al. (US 5,470,677).

The instant claims are to a gel electrolyte comprising a gelling agent forming a fibrous body associate via intermolecular bonding and an ionically conductive material wherein the gelling agent is non-polymeric.

Williams et al. (US 5,470,677) teaches an electrolyte gel for a battery which includes a gelling agent, an ionically conductive solvent and an electrolyte species. Polyhydroxy compounds including sorbitols are noted as gelling agents in column 2, the examples, and the

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claims. Battery components are included throughout the reference. Thus, the claims are anticipated.

7. Claims 1, 4, 5, 6 and 8-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Kaitoh et al. (US 4,996,334.)

Kaitoh et al. (US 4,996,334) teaches an electrolyte gel for a battery which includes a gelling agent, an ionically conductive solvent and an electrolyte species. Sorbitols are noted as gelling agents in the examples, and the claims. Battery electrodes are noted in example 17. Thus, the claims are anticipated.

Claim Rejections - 35 U.S.C. § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The rejection of claim 5 under 35 U.S.C. 103(a) as being unpatentable over Green et al. (WO 98/11619) in view of GB (2,212,504) has been overcome by the applicant's amendment.

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Williams et al. (US 5,470,677) as applied to claims 1, 3-4 and 6 above, and further in view of GB (2,212,504.)

The teachings of Williams et al. (US 5,470,677) have been presented above. Williams et al. (US 5,470,677) does not teach the use of the amide-substituted cyclohexane ring as the gelling

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agent of the electrolyte. GB (2,212,504) teaches a solid polyacrylamide electrolyte which includes an amide-substituted cyclohexane ring as a plasticizer (or gelling agent as known in the art.) Claim 1 discloses an amide linked material which may include a cycloalkyl-group. The electrolyte salts are dissolved in the additive materials in order to form gels (see page 5, lines 9-30). The amine is substituted, however the material is shown to dissolve the salt materials and conduct charge. It would be obvious to one skilled in the art at the time the invention was made to use the material with functional groups suitable for ionic conduction such as in the invention of Williams et al. (US 5,470,677) as the ionic salts are known to transfer charge across this gel medium. It would be obvious to use the polymer materials of GB (2,212,504) in the invention of Green, as the material is shown to be used for the same purpose to dissolve a salt in a polymer material and form a gel electrolyte for an electrochemical device.

11. Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams et al. (US 5,470,667), in view of Green et al. (WO 98/11619).

Williams et al. (US 5,470,667) teaches a cell comprising a gel electrolyte that includes an organic solvent, an electrolyte salt and a gelling agent such as sorbitols including DBS (which are polyhydroxy compounds, see col. 1, line 65- col. 2, line 49.) The gelling agent inherently gels by forming a fibrous associated body by intermolecular bonding. Williams et al. (US 5,470,667) does not teach a gel electrolyte that includes an ionically conductive material that is liquid at working temperature. In Williams, the electrolyte is a salt dissolved in an organic solution.

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Green et al. (WO 98/11619) teaches an electrolyte which comprises a composite of a polymer and a molten salt immobilized within the polymer. The molten salts may be pyridinium or imidazolium salts (see page 2, lines 1-10.) Polymers include polyethylene oxide, polyacrylonitrile and PVDF amongst others (see page 2, lines 10-21.) These polymers are gelling agents which are capable of forming a polymer associated body by coordination bonding or hydrogen bonding. Functional groups, such as carbonyls, are noted in these materials. These materials are also noted in the instant specification for the same use as the instant invention (page 2). The electrolyte is used in electrochemical cells and electrochromic windows (see abstract, page 3.)

It would be obvious to one of ordinary skill in the art at the time the invention was made to include a liquid salt as an ionically conductive material in Williams as the materials will provide improved ionic conductivity and improved operation at high temperatures as taught by Green. Green et al. (WO 98/11619) shows molten salts such as pyridinium or imidazolium in polymer gel electrolytes which are provided to transfer charge. One of ordinary skill in the art may substitute these liquid salts in Williams to provide improved ionic conductivity and operation at high temperatures. Further, it would be obvious to one of ordinary skill in the art at the time the invention was made to use the combination of a gel electrolyte with a liquid salt as an electrolyte in electrochromic windows as Green teaches gel electrolytes are used in electrochromic windows. The instant electrolyte will provide the same function of transferring charge.

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12. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makoto Ue (Electrochemica Acta), in view of Green et al. (WO 98/11619).

Makoto Ue teaches a cell comprising a gel electrolyte that includes an organic solvent, an electrolyte salt and a gelling agent such as DBS. The gelling agent inherently gels by forming a fibrous associated body by intermolecular bonding. Makoto Ue does not teach a gel electrolyte that includes an ionically conductive material that is liquid at working temperature. In Makoto Ue, the electrolyte is a salt dissolved in an organic solution.

Green et al. (WO 98/11619) teaches an electrolyte which comprises a composite of a polymer and a molten salt immobilized within the polymer. The molten salts may be pyridinium or imidazolium salts (see page 2, lines 1-10.) Polymers include polyethylene oxide, polyacrylonitrile and PVDF amongst others (see page 2, lines 10-21.) These polymers are gelling agents which are capable of forming a polymer associated body by coordination bonding or hydrogen bonding. Functional groups, such as carbonyls, are noted in these materials. These materials are also noted in the instant specification for the same use as the instant invention (page 2). The electrolyte is used in electrochemical cells and electrochromic windows (see abstract.)

It would be obvious to one of ordinary skill in the art at the time the invention was made to include a liquid salt as an ionically conductive material in Williams as the materials will provide improved ionic conductivity and improved operation at high temperatures as taught by Green. Green et al. (WO 98/11619) shows molten salts such as pyridinium or imidazolium in polymer gel electrolytes which are provided to transfer charge. One of ordinary skill in the art

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may substitute these liquid salts in Williams to provide improved ionic conductivity and operation at high temperatures.

Response to Arguments

13. Applicant's arguments filed 2/6/2002 have been fully considered but they are moot due to the new rejections applied as based on the amended claims. It is noted that the rejections may be reapplied upon the removal of new matter. The applicant's arguments to the detrimental use of dibenzylidene sorbitol derivatives as gelling agents in the prior art are not persuasive as the applicant's provide the same gelling agent in the instant invention.

Examiner Correspondence

14. Any inquiry regarding this communication or a previous communication should be directed to Examiner Mark Ruthkosky, whose telephone number is (703) 305-0587 or his supervisor, Patrick Ryan, whose phone number is (703) 308-2383. Please note that Examiner Ruthkosky is out of the office the first Friday of each bi-week period. The PTO official fax number is 703-872-9310, while the PTO after-final fax number is 703-872-9311.

MARK RUTHKOSKY
PATENT EXAMINER
ART UNIT 1745
Mark Ruthkosky
12/13/02